

I CLAIM:

1. Device for finishing and processing printed cardboard, cardboard packagings, corrugated board, paper or similar substrates (2), in particular through a rotary punching process, wherein the substrate (2) can be inserted in the feed direction (A) between two rotating processing rollers (4, 5) and is processed during passage by tool parts (7, 8) which are effective in the working gap (6), characterized in that a processing roller (4) with at least one gripper (9) is provided for register-controlled transport of the substrate (2).
2. Device according to claim 1, characterized in that the substrate (2) which is processed through punching and breaking out can be separated from a waste part (19) downstream of the processing rollers (4, 5).
3. Device according to claim 1, characterized in that the substrate (2) which is processed through punching can be accessed downstream of the processing rollers (4, 5) as a single-piece intermediate product (Z).
4. Device according to any one of the claims 1 through 3, characterized in that the processing rollers (4, 5) cooperate with a delivery roller (55) which is disposed downstream thereof to receive the substrate (2).
5. Device according to claim 4, characterized in that it is connected, in the region of the delivery roller (55) to a discharge conveyer band (57) whose conveying angle (56) can be adjusted.

6. Device according to any one of the claims 1 through 5, characterized in that the at least one gripper (9) is provided on the lower processing roller (4).
7. Device according to any one of the claims 1 through 6, characterized in that the lower processing roller (4), which is formed as a bottom roller, has one or more, in particular two grippers (9, 9') which are offset by 180°.
8. Device according to any one of the claims 1 through 7, characterized in that a gripper strip (12) is provided as gripper (9, 9') which is disposed in a peripheral transverse channel (11) of the processing roller (4).
9. Device according to any one of the claims 1 through 8, characterized in that a feed device (13) is disposed directly before the device on the reception side thereof by means of which the substrates (2) can be supplied in a registered manner.
10. Device according to claim 9, characterized in that the feed device (13) is disposed downstream of a sheet printing machine, in particular an offset printing machine, as a register-controlled discharge unit thereof.
11. Device according to claim 9 or 10, characterized in that the feed device (13) comprises grippers (14) which engage each substrate (2) from the sheet printing machine and transfer it to the gripper (9, 9') of the processing roller (4).

12. Device according to any one of the claims 9 through 11, characterized in that the respective transfer position (P) of the substrates (2) to the gripper (9, 9') of the processing roller (4) can be adjusted through register adjustment of the upstream sheet printing machine and/or the gripper (14) of the feed device (13).
13. Device according to any one of the claims 9 through 12, characterized in that the grippers (14) of the feed device (13) subtend a motion path (E) which approaches the motion path (D) of the gripper (9, 9') of the processing roller in a transfer region (P) in such a manner that, during transfer, the substrate (2) is simultaneously held in the transfer region (P) by the gripper (14) of the feed device (13) and the gripper (9, 9') of the processing roller (4).
14. Device according to any one of the claims 9 through 13, characterized in that, in the region of its end facing the sheet printing machine, the feed unit (13) is connected to a lacquering and/or drying unit (15, 16) for the substrates (2).

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15. Device according to any one of the claims 1 through 14, characterized by a downstream discharge device (18; 18') which receives the punched-out substrate (2) or receives same (2') as an initially punched intermediate product (Z), and a downstream disposing device (20) receiving the processing waste (19).
16. Device according to claim 15, characterized in that the disposing device (20) has a vacuum suctioning unit (22) disposed in the region of the end (21) of the discharge device (18) facing the processing rollers (4, 5) and/or a blowing air system for supporting separation of the substrate (2) from the waste (19).

17. Device according to claim 15 or 16, characterized in that the discharge device (18) comprises a table (23) whose upper side receives the substrates (2) and transports them away and defines, at its receiving end (21) and together with the lower processing roller (4), a passage gap (28) for downward passage (arrow F) of the waste part (19), produced through punching, to the disposing device (20).
18. Device according to any one of the claims 15 through 17, characterized in that a discharge conveyer band (57) is provided as discharge device (18') whose conveying direction (angle 56) can be changed and which cooperates with a delivery roller (55) accepting the substrate (2') from the lower processing roller (4) as an intermediate product (Z).
19. Device according to any one of the claims 1 through 18, characterized in that a substrate (2') which has been processed over its entire length can be transferred to the delivery roller (55) through grippers (55').
20. Device according to any one of the claims 1 through 19, characterized in that the at least one gripper (9) of the processing roller (4) is provided with a peripheral register adjustment device (31).
21. Device according to any one of the claims 1 through 20, characterized in that the processing rollers (4, 5) bearing the grippers (9, 9') are provided with a lateral and/or diagonal register adjustment device (arrow K, H).

22. Device according to any one of the claims 1 through 21, characterized in that the processing rollers (4, 5) bear replaceable processing tools (7, 8).
23. Device according to any one of the claims 1 through 22, characterized in that the processing rollers (4, 5) are formed as magnetic rollers on which the processing tools (7, 8) are replaceably fixed in the form of punching, grooving, perforating and/or embossing tools.
24. Device according to any one of the claims 1 through 23, characterized in that the processing rollers (4, 5) can be replaced individually, in total or in combination (arrow L, L').
25. Device according to any one of the claims 1 through 24, characterized in that at least one of the processing rollers (4, 5) is associated with a counter pressure roller (35).
26. Device for punching of in particular printed substrates (2) through processing rollers (4, 5; 81, 82) according to one or more of the claims 1 through 25, **characterized in that** the substrate (2) can be processed in the region of the processing rollers (4, 5; 81, 82) via a rolling stamped-line travel.
27. Device according to claim 26, characterized in that at least one of the processing rollers (4, 5) is/are supported in the region of their longitudinal axis (M, M') and/or the gripping strips (9) are supported on their rollers (4, 5) such that these components can be displaced into an inclined position (angle W, W'; 69, 69') for generating the rolling, punching process.

28. Device according to claim 26 or 27, characterized in that the printing machine delivery band (33) comprises a chain delivery (83) and an inclined (angle 70) register roller (71) located before the processing rollers (4, 5).
29. Device according to any one of the claims 26 through 28, characterized in that the lower processing roller (4) is connected to a processing module (80) via an inclined transfer roller (84) which receives the substrate between two inclined rollers (81 and 82) and transfers it to an inclined arm (86) via a downstream inclined delivery roller (85).
30. Device according to any one of the claims 26 to 29, characterized in that the processing rollers (4, 5; 81, 82) have a ratio of diameter to width of 1:1 or less, e.g. 1:1.2; 1:1.4 etc.
31. Device for punching printed substrates with processing rollers (4, 5) supported on a machine frame (40), in particular according to claim 1, characterized in that the axial separation (axes M, M') between the processing rollers (4, 5) in their operating position can be adjusted.
32. Device according to claim 31, characterized in that the machine frame (40) comprises an adjustable heating and/or cooling device (43; 43'; 66) disposed in the region of side supports (41, 42) having bearings (44, 44'; 45, 45') for the processing rollers (4, 5).
33. Device according to claim 31 or 32, characterized in that the heating and/or cooling device (43; 43'; 66) is connected to a regulating unit

(46; 64) detecting the temperature in the region of the side supports (41, 42).

34. Device according to any one of the claims 31 to 33, characterized in that at least one expansion body (58) is integrated in each side supports (41, 42) of the machine frame (40) for adjusting the axial separation (axis M, M') or the processing gap (59) via its variable load condition.
35. Device according to any one of the claims 31 to 34, characterized in that one side of the expansion body (58) is supported via adjusting screws (60, 60') on the respective side support (41, 42) and another side by a bearing member (63, 63') receiving support rollers (61, 61'; 62; 62') for the upper processing roller (5).
36. Device according to any one of the claims 31 through 35, characterized in that pretensionable spring elements in the form of spring packets (67, 67'; 68, 68') are integrated in the side supports (41, 42) between the bearings (44, 45; 44', 45') of the two processing rollers (4, 5).
37. Device according to any one of the claims 31 through 36, characterized in that the expansion body (58) has a heating cartridge (66) communicating with a second regulating unit (64) having temperature sensors (65; 65').